house in which I am writing, without interruption, from 7.30 A.M. till dark, and are now at 11.30 P.M., flying in at the open window, so as to be a perfect nuisance. They are still tired moths, for they soon settle; there are certainly many hundreds in the dark corners and along the cornice.[1] My children tell me that numbers of the moths were lying dead on the dry sand above high-water mark.[2] They collected some for a tame young magpie, which has been very happy all day among the flower-beds in the garden catching *P. gamma*, which, under ordinary conditions, would be far too wide awake for him.

How far the flight extended south of Trouville I do not know, but the number of insects which have passed from sea to land here to-day must be very great. Assuming that one *P. gamma* passed over each metre of shore line each minute, an estimate below the mark at all points to which my observation extended, and assuming the flight to have extended 10 kilometres along the shore, as I ascertained that it did during the evening, nearly 8,000,000 of *P. gamma* passed from sea to land between 7.30 A.M. and 8.30 P.M.

All the insects which I caught or looked at on flowers were in perfect condition.

Where have all these insects come from? Has the flight been noticed in England? *V. cardui* was exceedingly abundant here in June and throughout July, indeed it was the only butterfly to be seen in any numbers. Its larvæ have been feeding in tolerable numbers on the thistles and other plants, and some few fresh specimens appeared before the flight of to-day, but I think there is no doubt the insects which formed to-day's flight were not bred here. Why should the moth and the butterfly come together? Here they were flying against or nearly against, the wind, although they may have started with a favourable wind. Where will they go to? If they go far, what influence will they have on cross-fertilisation? The quantity of pollen which they will carry onwards from the myriads of flowers they have visited will be immense. Perhaps other observers may answer some of these questions. J. CLARKE HAWKSHAW

Trouville, Calvados, France, August 12

P.S.—The flight still continues this morning, August 13, 10 A.M.; *V. cardui* quite as abundant as yesterday.

P.S. No. 2.—The flight of *V. cardui* and *P. gamma*, described in my letter of August 12 ceased about 12 A.M. on the 13th. At 11 A.M. I counted forty-six and twenty-four *V. cardui* on the shore passing over a space of fifty yards in width, in two intervals each of two minutes. Judging from their number, the *V. cardui* have not remained here; on the other hand, I think many of the *P. gamma* have. On the 14th a large clearing in the forest of Tonques, about two miles inland, was alive with them. The flowers of the wood-sage appeared to be the great attraction there. I noticed many *P. gamma* lying dead on the roads inland, all in perfect condition. I believe that these moths died of starvation. The moths which flew into the house on the evening of the 12th were all more or less sluggish in the morning. There were more than 400 on one window, many of which readily took food offered to them in the form of syrup, and I induced a number of those in the forest to come on to my finger and suck up syrup.

What I have seen leads me to make the following suggestions as to the cause of these migrations of lepidoptera.

When a favourable season produces a great swarm of insects numbers would die from want of food if they remained where they came into existence, as the number of food-producing flowers is limited. To move off in some direction would be a necessity, and in time the impulse to migrate would become instinctive as soon as the want of food was felt, or even the presence of a crowd of their fellows. It would seem that the supply of food might be most readily found if the insects moved off in all directions, that is, spread from the centre of scarcity; but many moths seek their food by scent, and on that account generally, I believe, fly against the wind. Many facts might be given to show how acute the power of scent in moths is. Whether butterflies seek their food by scent or not I do not know; some are certainly attracted by strong odours, *Apatura iris*, for instance. At any rate, I think a hungry moth would fly against the wind, and so the general direction of a flight of moths might be determined.

Here both butterflies and moths searched the first flowers they came to after leaving the sea. The first comers would go on refreshed, but the later ones merely wasted their energy in a fruitless search, and many of the moths fell dead by the way.

In the case of the flight I have described, a double necessity for the migration would have arisen if the butterfly and the moth came into existence at the same time as, seeing their fine condition, they most probably did. As both appeared to search the same flowers, the dearth of food at their centre of departure would more speedily have arisen.—J. C. H.

August 23

Animal Rights

MR. ROMANES's parallel is as unsound as amusing. If a physiologist claimed to vivisect his children "on the plea that it was for this purpose that he had begotten them," we should tell him that the legal admission of such pleas would undermine human society. But in the killing of pigs for food no undermining of human society is involved. Moreover, we know that men breed pigs only to kill them, but that men breed children from entirely different motives; we should answer the physiologist that his plea was impossible of proof, that all human experience negatived its probability, and that consequently it could not be admitted to overrule his children's presumptive right of life.

Mr. Romanes repeats his amazing proposition in morals, that "if we have a moral right to slay a harmful animal in order to better our own condition, it involves an inconsistency to deny that we have a similar right to slay a harmlesss animal, if by so doing we can secure a similar end." Then, if we have a moral right to slay harmful Zulus to better our own condition, we have a similar right to slay harmless Eskimos, if by so doing we can secure a similar end!

Mr. Romanes says that I did not attempt to meet one of his criticisms. Had I thought I might, I would have met them all; it does not take long. He thinks a lobster, to whom might is right, could not convince a philosopher that the latter had no right to eat him. Then I may pick a thief's pocket? He next admits that the lobster might appeal to the philosopher's morality, but asks why "the right of an edible animal to live is superior to that of an eating animal to kill?" Then the right of a robbable man to his money is not superior to the right of a man who uses money to rob him? And I, who am edible, have no more right to live than a cannibal has to eat me? Lastly, Mr. Romanes makes his philosopher say that he prefers lobster salad and roast lamb to boiled snakes and rat pie. Preferences are not rights, but if they were I have not suggested that the latter diet should supersede the former; and so my withers are unwrung.

EDWARD B. NICHOLSON

[*Ergo* the rights of a pig are *not* the same as those of a baby, which is just the point which my purposely unsound parallel was intended to show. It is for Mr. Nicholson to prove that the parallel is *sound*, if he is to sustain his "erroneous premiss," that the rights of men and animals are identical (the objection as to "motive" I ignore, because on the erroneous premiss in question the physiologist's motive might be sincerely stated and adequately proved as *a* motive by a declaration, say, in the marriage settlements). Instead of doing so, however, he alludes to one important difference between the rights of an animal and those of a man—the difference, namely, which arises from the latter being a member of human society. And this difference is in itself sufficient to nullify the force of all his rejoinders. Only on Mr. Nicholson's own supposition, that the rights of all living things are identical, could any of my propositions made with reference to animals be tested by their applicability to men. But this is just the supposition which I regard as absurd, and because it seems to me that ethical doctrine is here sufficiently patent—viz., that man as an intellectual, moral, and social being has rights additional to those of a merely sentient being. I will not take any further part in this correspondence.]

GEORGE J. ROMANES

Alpine Clubs

IN your account of the late conference of Alpine clubs, held at Geneva, there is one little omission which, as interesting to the scientific world generally, I beg leave to remedy.

It was suggested by your humble servant that a re-publication of de Saussure's "Voyages dans les Alpes" would be an appropriate memorial of our little congress at the city of which he was, I may say yet is, so bright an ornament. My plan was to

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[1] I have counted 200 on one part of the cornice.

[2] Possibly killed by the heat of the sand, on which they settled in an exhausted state.

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add the matter necessary to bring his work up to date in science, within square brackets (as in Stephen's edition of "Blackstone's Commentaries"), or as notes, or even as an appendix, the whole work to be in the hands of an efficient committee. The proposition was very cordially received, and I should like to hear what English men of science think of the matter. The book is of the freshest, brightest nature; even as a small boy I delighted in it; and my own idea is that de Saussure, though necessarily behind the giant strides of modern knowledge, made so very few mistakes that re-publication would not have the same dangers for his reputation as it might for that of a mere mediocrity.

MARSHALL HALL

Vernex-Montreux, Canton Vaud, Switzerland, August 19

"Report of an Unusual Phenomenon Observed at Sea"

I CAN supply a second instance of the "unusual phenomenon observed at sea," communicated by the Hydrographer of the Navy to NATURE, vol. xxi. p. 291.

One night in April, 1875 (I cannot give the exact date, as my notes were lost in the ship) H.M.S. *Bulldog* was lying becalmed in a glassy sea off a point of land a few miles north of Vera Cruz, when a line of light appeared along the northern horizon, and unaccompanied by the least breath of wind, swept towards and past the ship, in a series of swift luminous pulsations, precisely similar to those described by Mr. Pringle. Acting on the old sea formula, "observed a phenomenon, caught a bucketful," we dipped up some of the water, and found noctilucæ and crustaceans in it. These may have supplied the luminosity, but if so, the exceedingly swift-travelling cause of their stimulation would still remain unaccounted for.

A squall accompanied by incessant thunder and lightning overtook the ship the same night.

EDWARD L. MOSS

Rathgar, Dublin, August 19

Boring Molluscs

THE following extract from Prof. Joseph Leidy's paper on "Vertebrate Remains, chiefly from the Phosphate Beds of South Carolina," which appeared in NATURE, vol. xx. p. 354, will serve in aid of the solution of the still open question, By what means do the boring molluscs penetrate hard rocks?—"The fossils mainly consist of the harder parts of the skeleton and of teeth, usually more or less water-worn, indicating shallow seas and an active surf to which they were exposed. Many of them exhibit the drilling effects of boring molluscs, especially those which are supposed to have been derived from the tertiary marl rock, the operation of drilling apparently having been performed both before and during the time the fossils were imbedded in the rock. Only enamel, or the enamel-like dentinal layer such as is found investing the crown of the teeth of sharks, appears to have been a protection against the drilling power of the borers."

Were the burrows produced by the solvent action of an acid, there is no reason why the enamel should have arrested the solvent rather than the dentine, although it might yield more slowly to it; but its refractory behaviour under friction accounts for the Pholades and Teredines being nonplused; while their desistance from fruitless efforts affords an instructive example of pure *instinctive* action, *i.e.*, reflex action "the prompting to which is given by sensations."

PAUL HENRY STOKOE

Beddington Park

Intellect in Brutes

A CORRESPONDENT of yours tells a tale (NATURE, vol. xx. p. 338) about a cat ringing a bell to be let in. Without any wish of "topping" this tale, I think the following will go far to demonstrate the existence of a thinking power in the brute brain, if indeed that fact is ever doubted:—

Some relatives of mine living in Sussex owned a very intelligent dog of somewhat doubtful breed, having, however, a decided touch of the French poodle in his composition. In addition to this animal they also had a favourite cat. For some time they were bothered in the way your correspondent describes by runaway knocks, instead of rings, as in his case; however, they discovered that the cat had learnt to stand on her hind legs and reach the knocker which was low on the door, and to knock distinct and separate double knocks until she was admitted. This in itself was curious, but a short time after they discovered this fact they discovered another still more curious. They were in the habit of turning the dog out every evening for an airing. It invariably happened that if the cat was out of the house at the same time, that a short time after the dog was turned out they would hear a knock at the door. On its being opened both animals would be found outside and would immediately come in, the dog always allowing the cat to precede him. There seems to be no doubt that the dog finding out that the cat could obtain entrance was in the habit of searching for her when he wanted to come in, and either waiting till she was ready to knock at the door, or of inducing her to do it to please him. I can myself vouch for the above facts.

W. H. KESTEVEN

Holloway, August 13

MR. LAYARD's letter mentioning the bell-ringing cat leads me to send the following account of a wise old Scotch collie with which I was personally acquainted. Toby, belonging to my friend Mr. T. F. Hancock, formerly of Tyes Place, Staplefield, Sussex, was passionately fond of his vocation, but at the same time made much of in the parlour. On one occasion, while lying in front of the fire in the dining-room, he heard sheep going by the house along the farm-road. He ran to the window-seat and then to the door, at the same time looking imploringly at my friend's sisters, as if to beg them to let him out. This, however, they declined to do, and after one or two journeys between window and door, he ran to the long, old-fashioned bell-pull, rang the bell, stood at the door, and bolted out and round into the kitchen as soon as the servant appeared.

After this Toby was constantly employed during meals to ring the bell, and I have myself often made him perform the operation, which was always accompanied by a good deal of barking. My friend has a more than life-sized painting of this wise dog, painted by the late Charles Hancock, the animal-painter.

One more instance of reasoning I will relate. A few months ago my wife and I were bathing a cocker dog in the stream flowing through the grounds of St. Helen's, Cockermouth. We threw a croquet-ball into deep water, and the dog was to bring it to shore. But the ball was rather large for the size of her mouth, and as often as she snapped at it the ball glided away. After vainly endeavouring to grip the ball, we watched her suddenly give over, and begin pawing it with her fore-feet until she brought it into shallow water, when she easily made the capture, and brought the ball to the bank. The same was repeated several times. It is unnecessary to say that this was not the result of teaching.

J. CLIFTON WARD

Keswick, August 14

As your pages have for some time drawn attention to such inquiries, I wish to ask if any one ever saw a favourite dog, or other animal, stop to gaze at a rainbow? We have never heard of such a case; but if ever encountered a record in your pages is invited.

BENJ. ALVORD

Washington, August 7

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